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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,122	07/28/2000	Candice Hellen Brown Elliot	CLRV-001	2606

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EXAMINER
HAVAN, THU THAO

ART UNIT	PAPER NUMBER
2672	15

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/628,122	ELLIOT, CANDICE HELLEN BROWN	
	Examiner	Art Unit	
	Thu-Thao Havan	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *12, 13* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. Claims **1-49** are pending in the present application.

2. Applicant's arguments filed July 18, 2003 have been fully considered but they are not persuasive. As addressed below, Silverbrook and Hill et al. teach the claimed limitations.

A.) Silverbrook teaches each emitter is connected to a driver and at least two neighboring blue emitters are connected to the same driver (col. 2, line 48 to col. 3, line 30). In other words, Silverbrook teaches a color display apparatus having a first plurality of independently illuminable areas connected to second plurality of data drive lines, each of said illuminable areas being assigned to one of a plurality of primary color components, wherein said data drive lines are allocated to said primary color components in a ratio such that the condition of the illuminated areas to one color component is different from that of the illuminated areas to the other color component. Further constraints include a general need to limit the number of opaque drive lines available for driving the areas of a pixel which can be independently illuminated, and the need to faithfully reproduce the desired image with as little distortion as possible. Referring now to figure 23, there is shown, for illustrative purposes, a sectional plan view of the overlay between the common layer, comprising common metal layer and common transparent layer. A data level layer, comprising data metal layer and data transparent layer is also shown. Each column of pixels includes four associated drive lines, and the first drive line being utilized to drive a four unit area red electrode, the

second drive line is utilized to drive a two unit area red electrode area. The drive line is utilized to drive a four unit area green electrode, the drive unit drives a two unit area green electrode, and the drive unit drives a one unit area green electrode. Finally, drive line is utilized to drive a eight unit blue electrode area. The common electrodes are formed in rows and a pixel is addressed in the normal manner.

B.) Silverbrook teaches an image capture device substantially comprising a plurality of three-color pixel element (col. 5, lines 8-21), each three-color pixel element comprising a blue emitter (col. 7, line 7 to col. 8, line 32), a pair of red emitters and a pair of green emitters such that red emitters (col. 11, line 55 to col. 12, line 11) and green emitters form substantially a checkerboard pattern upon image capture device (figs. 4, 7-8, 13, 15, 18, and 23). In other words, Silverbrook discloses a pixel layout for a display having six drive lines, divided into two red drive lines, three green drive lines and one blue drive line. The pixel layout is suitable for utilization with many different types of displays including FLCD displays. The eye, being most sensitive to green, will pick up the error due to the discrete nature of the green sub-pixels more readily than the other two primary colours. For blue colours, the errors are less noticeable since the eye is not as sensitive to blue when compared to green or red. Therefore, more drive lines are devoted to green, a lesser number of drive lines are devoted to red, and even fewer drive lines are devoted to blue. The green color has more subpixels and, as such, will have more discrete levels per pixel. This has the effect of reducing the threshold error for green. Furthermore, figure 7 illustrates the concept where is the maximum error. However, to increase the number of levels of green, the number of levels of blue were

decreased thus the error for blue is increased. A decrease in the number of blue levels does not have a very significant effect on the overall appearance of the displayed image as the eye is not as sensitive to blue as it is to green. In order to determine the number of address lines to be assigned to each primary color, a choice approximating the ratio of the eye's response to the individual colors can be made.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US patent no. 6,008,868) in view of Hill et al. (US patent no. 6,88,385). Re claims **1, 6, 11, 39, and 42**, Silverbrook discloses a three-color pixel element for a display comprising a blue emitter disposed at an origin of a rectangular coordinate system having four quadrants (col. 5, lines 8-21); a pair of red emitters spaced apart from blue emitter and symmetrically disposed about origin in a first pair of opposing quadrants of rectangular coordinate system (col. 7, line 7 to col. 8, line 32); a pair of green emitters spaced apart from blue emitter and symmetrically disposed about origin in a second pair of opposing quadrants of rectangular coordinate system (col. 11, line 55 to col. 12, line 11); and each emitter is connected to a driver and at least two neighboring blue emitters are connected to the same driver (col. 2, line 48 to col. 3, line

30). In other words, Silverbrook teaches a variable degree of complexity to each primary color in a pixel layout depending on the perceptual response of the human eye to the particular primary color. For example, Silverbrook teaches a pixel layout for a display having six drive lines, divided into two red drive lines, three green drive lines, and one blue drive line. Thus, a three-color pixel element for a display in Silverbrook consists of a blue emitter, a pair of red emitters, and a pair of green emitters (col. 5, line 8 to col. 6, line 16; figs. 4 and 8). In addition, Silverbrook teaches a color display apparatus having a first plurality of independently illuminable areas connected to second plurality of data drive lines, each of said illuminable areas being assigned to one of a plurality of primary color components, wherein said data drive lines are allocated to said primary color components in a ratio such that the condition of the illuminated areas to one color component is different from that of the illuminated areas to the other color component. Further constraints include a general need to limit the number of opaque drive lines available for driving the areas of a pixel which can be independently illuminated, and the need to faithfully reproduce the desired image with as little distortion as possible. Referring now to figure 23, there is shown, for illustrative purposes, a sectional plan view of the overlay between the common layer, comprising common metal layer and common transparent layer. A data level layer, comprising data metal layer and data transparent layer is also shown. Each column of pixels includes four associated drive lines, and the first drive line being utilized to drive a four unit area red electrode, the second drive line is utilized to drive a two unit area red electrode area. The drive line is utilized to drive a four unit area green electrode, the drive unit

drives a two unit area green electrode, and the drive unit drives a one unit area green electrode. Finally, drive line is utilized to drive a eight unit blue electrode area. The common electrodes are formed in rows and a pixel is addressed in the normal manner.

Silverbrook *fails* to specifically disclose "a rectangular coordinate system" as claimed. However, Hill (col. 1, lines 19-43) indicates that it's well known to have a rectangular coordinate system for a three-color pixel element for a display. In other words, Hill teaches pixel is commonly used to refer to one spot in for example a rectangular grid of thousands of such spots. The light emitted from one or more triads of red, green, and blue phosphor dots that tend to blend together giving at a distance the appearance of a single colored light source.

Therefore, taking the combined teaching of Silverbrook and Hill as a whole, it would have been obvious to modify Hill to implement a rectangular coordinate system having four quadrants as claimed. Doing so would enable reconstruction of spots individually used by a computer to form an image on the display device (col. 1, lines 19-43).

Re claims **2-5, 7-10, and 12-15**, Hill teaches blue, red, and green emitter is polygonal having corners aligned at x and y axes of rectangular coordinate system and each having an inwardly-facing edge parallel to a side of polygonal (col. 12, lines 13-67). In other words, Hill teaches scaling in the direction perpendicular to the striping at a rate of 10x while scaling is performed at a rate of 1x in the direction parallel to the striping. Scaling in the horizontal (X) direction is applied at a rate of x3 while scaling in the vertical (Y) direction is applied at a rate of x1.

Re claims **16-21 and 26**, Silverbrook teaches a three-color pixel element in a shape of a square for a display comprising (figs. 4, 8, 13 and 15) a pair of red emitters (col. 1, lines 15-25), a pair of green emitters (col. 1, lines 38-46); and a blue emitter disposed at a center of square (col. 2, lines 48-67). In other words, figure 4 of Silverbrook teaches a shape of square for a display with each primary colors (i.e. a pair of red, green, and blue) component in a ratio such that the condition of the illuminated areas to one color component is different from that of the illuminated areas to the other color component.

Silverbrook *fails* to specifically disclose "outer corners of each forming a first two opposing corners of a square" as claimed. However, Hill (col. 1, lines 19-43) indicates that it's well known to have outer corners of each forming a first two opposing corners of a square for a three-color pixel element for a display. In other words, Hill discloses the image's outline is adjusted so that portions of the image adjoin pixel sub-component boundaries (col. 13, line 40 to col. 14, line 57). In that the image's outline (i.e. the corners of a square) forming opposing corners. For example, the distance between the character image and left and right side bearing points used for determining character position and spacing on the screen are adjusted as a function of pixel sub-component boundaries.

Therefore, taking the combined teaching of Silverbrook and Hill as a whole, it would have been obvious to modify Hill to implement outer corners of each forming a first two opposing corners of a square as claimed. Doing so would enable to adjust

character spacing to scale geometry representing character into a bitmap image (col. 13, line 40 to col. 14, line 57).

Re claims **22-25 and 27-30**, Hill teaches blue emitter disposed at center of square and is polygonal having sides aligned such that imaginary lines perpendicularly bisecting each side pass through corners of polygon and red and green emitters are polygonal, each having an inwardly-facing edge parallel to an edge of polygonal blue emitter (col. 3, lines 21-58; col. 5, line 36 to col. 6, line 26; col. 12, lines 13-67). In other words, Hill teaches pixel sub-component (i.e. either blue, red, or green) occurs at the center of the sample with the scaling operation scaling in the perpendicular and parallel directions of the polygon.

Re claims **31-34**, the limitations of claims 31-34 are identical to claims 1, 6, and 11, 16, 21, and 26 above therefore they are rejected based on the above claims except for the limitations a plurality of row positions and a plurality of column positions.

Silverbrook fails to teach a plurality of row positions and a plurality of column positions. But, Hill teaches a plurality of row positions and a plurality of column positions (col. 2, lines 21-49). In other words, Hill illustrates a LCD screen comprising a plurality of rows and columns with each row and column intersection forms a square which represents one pixel element.

Therefore, taking the combined teaching of Silverbrook and Hill as a whole, it would have been obvious to modify Hill to implement a plurality of row positions and a plurality of column positions as claimed. Doing so would enable each row and column to form a square which represents one pixel element (col. 2, lines 21-49). Furthermore,

it is well known to have a plurality of row positions and a plurality of column positions for displaying images for full color imaging devices.

Re claims **40 and 47-48**, Silverbrook teaches an image capture device substantially comprising a plurality of three-color pixel element (col. 5, lines 8-21), each three-color pixel element comprising a blue emitter (col. 7, line 7 to col. 8, line 32), a pair of red emitters and a pair of green emitters such that red emitters (col. 11, line 55 to col. 12, line 11) and green emitters form substantially a checkerboard pattern upon image capture device (figs. 4, 7-8, 13, 15, 18, and 23). In other words, Silverbrook discloses a pixel layout for a display having six drive lines, divided into two red drive lines, three green drive lines and one blue drive line. The pixel layout is suitable for utilization with many different types of displays including FLCD displays. The eye, being most sensitive to green, will pick up the error due to the discrete nature of the green sub-pixels more readily than the other two primary colours. For blue colours, the errors are less noticeable since the eye is not as sensitive to blue when compared to green or red. Therefore, more drive lines are devoted to green, a lesser number of drive lines are devoted to red, and even fewer drive lines are devoted to blue. The green color has more subpixels and, as such, will have more discrete levels per pixel. This has the effect of reducing the threshold error for green. Furthermore, figure 7 illustrates the concept where is the maximum error. However, to increase the number of levels of green, the number of levels of blue were decreased thus the error for blue is increased. A decrease in the number of blue levels does not have a very significant effect on the overall appearance of the displayed image as the eye is not as sensitive to blue as it is

to green. In order to determine the number of address lines to be assigned to each primary color, a choice approximating the ratio of the eye's response to the individual colors can be made.

Re claims **35, 37-38, 41, 43-46, and 49**, the limitations of claims 35 and 37-38 are analyzed as discussed with respect to claims 1, 6, 11, 16, 21, 26, 31, 34, 39-40, 42, and 47-48 above.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu-Thao Havan whose telephone number is (703) 308-7062. The examiner can normally be reached on Monday to Thursday from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Thu-Thao Havan
September 22, 2003

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600